

METHOD AND SYSTEM FOR OPTICALLY TRACKING A TARGET USING  
AN INTERFEROMETRIC TECHNIQUE

ABSTRACT OF THE INVENTION

5 An optical position-tracking system comprises an optical device for  
generating an incident light beam and a reference light beam from a light  
beam. Moreover, the optical position-tracking system further comprises a  
light beam steering device for sweeping the incident light beam through an  
angular range to cause a reflection of the incident light beam by a target,  
whereas the reflection of the incident light beam is directed to interfere with  
10 the reference light beam to form an interference light beam. Additionally, the  
optical position-tracking system enables determination of a position of the  
target using an interferometric technique utilizing an angular value of the  
incident light beam and the interference light beam, whereas the angular  
value depends on the reflection. If the light beam has a plurality of  
15 wavelengths, either due to the existence of these wavelengths  
simultaneously, or over a time interval having multiple wavelengths, the  
absolute position of the target can be determined. If the light beam has a  
single wavelength, the relative position of the target can be determined.